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ABSTRACT

The Yale Child Welfare Research Program was a comprehensive, service centered, longitudinal, intervention project for low-income families and their children. Eighteen children from inner city, low-income, predominantly black families participated in the intervention program from before birth to 30 months of age. Each family was assigned a team of project staff members who provided services and recorded their work with and observations of the families. Data were collected on four major components of the program: (1) home visitor program, (2) Pediatric care, (3) developmental evaluation, and (4) day care and toddler school. One year after the project ended, a matched comparison sample of 18 children 30 months of age was selected. Each comparison mother was seen for a single in-depth interview and each comparison child was seen once for a developmental evaluation. Five years after the project ended, follow-up interviews were conducted with 15 of the original research group mothers and each of the research group children was seen in a follow-up testing session. Findings are presented in detail. Results were interpreted as suggesting that the intervention had served to offset the detrimental effects of socio-cultural deprivation on the research group children's verbal abilities and had helped the project families improve their quality of life. (JMB)

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The Yale Child Welfare Research Program: Description and Results

Leslie A. Rescorla, Sally Provence and Audrey Naylor

This report presents some of the results of a comprehensive intervention project for low-income families and their children: the Yale Child Welfare Research Program. The program was carried out at the Yale Child Study Center from 1967-72 supported by a grant from the United States Children's Bureau (later the Office of Child Development). The project has been described in detail in The Challenge of Daycare (Provence, Naylor, and Patterson, 1977). Sally Provence, M.D. and Audrey Naylor, MSW served as project director and assistant project director. The job of condensing, analyzing, and reporting the data was carried out by Leslie Rescorla, Ph.D. a psychologist who was hired several years after the project ended. The data reported here were collected during the intervention program as well as five years after the project ended when the families were seen for follow-up.

The Yale Child Welfare Program was one of a number of ambitious, comprehensive demonstration projects undertaken in the late Sixties to help disadvantaged families and children: the Syracuse Family Development Research Program (Lally, 1971), The Frank Porter Graham Child Development Center (Robinson, 1968), the Peabody Early Training Project

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(Klaus & Gray, 1968), the Ypsilanti Carnegie Infant Education Project (Lambie, Bond & Weikart, 1974), the Florida Early Childhood Stimulation program (Gordon & Guinagh, 1977), the Washington, D.C. Infant Education Research Project (Schaefer & Aaronson, 1972), as well as many other programs. The literature on early intervention programs has been reviewed amply elsewhere (Bronfenbrenner, 1974; Day & Parker, 1977). Only the major issues and findings in the area will be outlined here.

The most commonly used index of program effectiveness has been child's IQ. With the exception of a few programs with massive "ecological" interventions where IQ gains reported are enormous (25-30 points in the Heber program (Bronfenbrenner, 1974)) the majority of early intervention programs have achieved a significant but modest level of IQ superiority relative to control groups (Klaus & Gray, 1968; Levenstein, 1977; Schaefer & Aaronson, 1972; Lambie, Bond & Weikart, 1974; Lally & Honig, 1977). A few studies have reported particular gains on language ability (Clarke-Stewart in press).

A prominent outcome in many intervention studies has been a fading out of IQ gains after the program terminates. While some programs report continued superiority on IQ measures or achievement test scores by third and fourth grade (Klaus & Gray, 1968; Gordon & Guinach, 1977; Levenstein, 1977) many other studies have found that program effects were no longer significant at follow-up (Schaefer & Aaronson, 1977; Lambie, Bond & Weikart, 1974; Lally & Honig, 1977). Though some studies have demonstrated that participation in follow-through or continued enrichment programs served to maintain early gains (Abelson, 1974), other studies reported IQ declines while children were still enrolled in the original intervention program (Lally & Honig, 1977; Klaus & Gray, 1968).

Bronfenbrenner (1974) has argued that projects which involve parents are more effective than center-based programs without parental involvement. Projects such as Levenstein's (1977) which involved structured work with the mother-child dyad, or Schaefer's (Schaefer & Aaronson, 1972) which provided for a mother to observe enrichment sessions between her young child and a home tutor, are seen by Bronfenbrenner to show more durable gains. However, Clarke-Stewart (in press) has recently argued that evidence on his point is equivocal. It seems valid to conclude from the literature that a structured, cognitive child-centered program may maximize test performance and early school competence but that programs which do not make some impact on family attitudes and patterns of interacting will not produce longterm sustained gains. As Gray has said, "Intervention programs before school entrance cannot carry the entire burden of improving educability.." (Ryan, 1974).

While reviewers agree that there is no magic period for starting interventions, programs seem to be most effective when they involve younger children (Bronfenbrenner, 1974; Clarke-Stewart). Bronfenbrenner has concluded that the optimal period for intervention is in the first three years of life. He proposes a family based program to enhance mother-child interaction in the early years, followed by a preschool enrichment program which prepares the child for school but still stresses the crucial value of parent involvement. Clarke-Stewart concurs with Bronfenbrenner that the earlier programs begin and the longer they run (up to three years duration), the more effective they tend to be.

A repeated theme in the literature has been dissatisfaction with IQ gain as the ultimate criterion of program effectiveness. Zigler (Zigler & Trickett, 1978) has recently proposed that gains in a com-

posite of areas summarized as "social competence" is a more appropriate index of program effectiveness. Clarke-Stewart has also recently argued for more "complex and multi-variate strategies" for assessing outcomes, including emotional, motivational, and achievement factors. Some programs have reported positive changes in mothers as important outcomes (Karnes & Badger, 1969; Gordon & Guinagh, 1977; Lally & Honig, 1977), with mothers making educational and occupational gains, becoming more involved in community affairs, and developing more constructive child-rearing approaches. A recent report on a collaborative long-term follow-up of twelve early intervention projects (Consortium, 1978) argues that the most significant benefits of preschool programs in both a statistical and a social sense are that intervention group children have shown less grade retention and less assignment to special education classes than control children and that intervention mothers express higher vocational aspirations for their children than control mothers.

As this brief summary of the early intervention literature indicates, findings are complex and equivocal. While significant intervention effects have been found in many studies, much remains to be learned: which strategies of intervention are most effective for different areas of outcome; which areas of project impact yield the most longstanding gains; how do different kinds of families and children utilize interventions; and which factors or variables are the best predictors of intervention outcome. While the intervention program reported here was of much smaller scale and involved fewer families than many programs reported in the literature, its more intensive and clinically oriented case approach may be helpful to illuminate some of these important and subtle issues associated with progam impact.

PROJECT DESCRIPTION

Goals of the Project

The project had three major goals. First, through various kinds of intervention based on knowledge of human needs and of child development, we wanted to try to diminish the erosion of human potential often associated with conditions of poverty or inadequate care in the earliest years. Finding effective ways of helping young children whose development was already at risk or was likely to become so was related to that goal. We believed that helping young parents with child rearing and with the stresses they experienced would increase their ability to rear healthy children and that intervention would be most effective if it began early in the life of the child. We expected that interest in parents and appropriate assistance to them would enhance the quality of their own lives. Secondly, it was hoped that providing services in a research context would lead to the development of more effective methods of preventing or alleviating the intellectual impairment and personality damage referred to above, methods which could be usefully disseminated to clinicians and other human services providers. While it will not be discussed in this paper, a third goal was related to child development theory in general. It was expected that involvement of an interdisciplinary research team in such a project would permit the examination, extension and elaboration of certain aspects of developmental theory. A clinical approach and a service-centered investigation were chosen as methods most suited to the goals of the project.

Theoretical Approach

The approach to research and service activities can best be characterized as clinical-developmental. In this approach, clinical assess-

ment provided the basis for individualizing services to a child and family. Additionally, clinical methods and constructs were used in collecting and organizing the research data. The approach was developmental as well--developmental in its view of physical and mental growth and in its view of the child's progress as a social being in a family and community.

The biological dimensions of our view can best be briefly stated in terms of embryological developmental processes encompassing such concepts as endowment, phase specificity, maturation and adaptability. The interaction of innate and experiential factors as co-determinants of development was an important theoretical construct of the aoproach.

The theoretical assumptions that underlie many of the concepts of development utilized are those of psychoanalytic child psychology, in particular those propositions that concern the influence of the parent-child relationship as manifested in the child's emotional development, his attitudes toward learning, his characteristics of thought, his view of himself as a thinking, feeling and learning person, and his ability to form relationships with others. In this approach the child's interaction with the human environment and the material world is emphasized, as is the interaction between cognitive and affective spheres of development.

In regard to the education of young children we share the view of Shapiro and Biber (1973) that "the growth of cognitive functions--acquiring and ordering information, judging, reasoning, problem solving, using systems of sybols--cannot be separated from the growth of personal and interpersonal processes--the development of self-esteem and a sense

of identity, internalization of impulse control, capacity for autonomous response, relatedness to other people." Educational goals are conceived in terms of developmental processes, not mainly as concrete achievements on the way to specified accomplishments. We have relied, too, on Piaget's view of the development of intelligence, finding it helpful both theoretically and in developing guidelines for action.

The clinical and developmental viewpoints are combined with an awareness that the societal systems that influence children and their families are expressed through institutions such as health and social services and schools, and must be the concern of those who work to enhance the well-being of children and adults.

Subject Selection

The project was divided into two phases. The first phase was a pilot group of 23 children ages 14 months to 4 years. The pilot program was used to recruit and train personnel, to practice working together, to refine research methodology and to gain the benefits of experience in trying new ways of providing services and modifying traditional ones. The children in the pilot group program will not be reported here. The subjects of this report are eighteen children from seventeen low income families who participated in the intervention program from before birth to 30 months of age.

It was recognized that the effectiveness of working with the families could best be evaluated if it began before environmental influences had affected development, that is, during pregnancy or at least at the time of birth of the infant. First born children were

chosen, in order that parents might be influenced early in their parenthood. Mothers were selected from those registered for obstetrical care in the Women's Clinic of the Yale-New Haven Medical Center. A project staff member reviewed clinic records and selected those that (1) lived in the inner city, (2) were in the poverty group as defined by the federal government, (3) had no serious complications of pregnancy and (4) were not markedly retarded or actively psychotic. After that selection, a staff social worker went to the clinic on the day of each expectant mother's next appointment and interviewed her about her interest in joining the study. She was told about the project, the services it would provide and the obligations it would impose on the family. The fathers, when available, were included. The services they would receive were described in concrete terms. They were represented as not free but in return for the time parents would be asked to give throughout the study by talking regularly with staff and by bringing children for physical and developmental examinations, for daycare if they needed it, or for shorter periods similar to nursery school. Each prospect was also given a brochure that stated in simple and direct terms the purpose of the study, the services it would provide and the obligations of membership. The final agreement to join the project was, in effect, a verbal contract between the parents and the project staff.

Twenty-five women were interviewed and twenty agreed to participate. One child was stillborn, and one child is excluded from this report though he remained in the project because a biological handicap was discovered when he was several months of age; the third family was the only one that dropped out after joining the study. The fact that

only one family dropped out later(for unknown reasons) was due, at least in part to the care taken in the admission process from first contact to final agreement. The emphasis in this process was on the importance of the parents' role in helping their child develop, on the mutuality of the work to be done--the obligations and roles of parent and staff--as well as on the services to be provided.

Families were selected for the project in three waves between the fall of 1968 and the spring of 1970 because this was most favorable for the staffing pattern. Data collection ended when the children were 30 months old. Of eighteen research children from the seventeen families twelve were black, two were white, two were mixed--white mothers and black fathers--and two were Puerto Rican, the last family being the one to have a second child during the study. There were eleven boys and seven girls. There were eight intact and nine one-parent families. In seven of the latter either the child's father or another man was a more or less regular member of the household. At the point of admission six of the eight intact families were self-supporting and two were on public welfare. Of the single young woman one was entirely self-supporting, one was supported by her parents and seven by public welfare. Their age range was 18-24: three were 18, two were 19, two were 20, seven were 21 and three were 24 years old. Eleven of them had completed high school; six had not. Contacts with each family continued during the period before the infant was born and increased greatly from birth on.

Project Setting

The project was located in a remodeled old residence called Children's House in one of the inner city slums of New Haven. The residential section of this area is less than 1 square mile into which

according to the 1970 census 21,628 persons were crowded. The district suffered from the blight common to such areas all over urban America: overcrowding in deteriorated buildings, lack of playspace, littered streets and a generally dreary appearance. It is an old part of the city and is the main place in New Haven for settlement of migrants from Southern United States and Puerto Rico. There are large numbers of Italians, Blacks, Puerto Ricans and Irish; a smaller number of Anglo-Saxons, Germans, Jews, and Slavs. While there are individual exceptions, most residents of this area suffer the consequences of low educational level, low incomes and underemployment.

Staff and Services

The project staff was composed of experienced clinicians in social work, psychology, nursing, pediatrics and psychoanalysis augmented by early childhood educators and research psychologists. For each family there was a "family team" whose function was to provide services and to record their work with and observations of the families. The family team members were a home visitor, pediatrician and developmental examiner, and as soon as the child was in daycare or toddler school, his teacher. There were other research staff members who observed the regular pediatric and developmental examinations and the daycare and toddler school sessions but had no direct contact with the families. Data collected by both participant and non-participant observers were pooled for the analyses reported here. There were four major components of the service around which research data were collected: the (1) home visitor program (2) pediatric care (3) developmental evaluation and (4) daycare and toddler school. Each of these components has been fully described in The Challenge of Daycare and will be briefly summarized here.

Home Visitor Program: The primary goal of the study, to promote the development of disadvantaged young children, could not be achieved, it was believed, without entering into a partnership with parents that recognized the parents' crucial role in their child's development, but a role with which the staff was prepared to help. Thus, each family was assigned a home visitor who, more than any other staff member, was "the parents' person," identified more clearly with parental needs.

Frequent regularly scheduled interviews* were the means of getting to know parents, of developing a relationship in order to try to be of help to them with whatever problems each faced. In order to do so home visitors needed to assess which were reality problems due to poverty and consequent lack of the resources available to others, which were the consequence of second-class citizenship--lack of self-confidence, feelings of hopelessness--and which were related to more deep-seated personality factors that might or might not be accessible to psychological intervention. Interviews were focussed in whatever areas of need parents identified. In some situations much tangible help was given with a view to reducing stress that adversely affected parenting. Building of self-esteem and supporting aspirations for a better life were among the goals of the work. Child care advice was rarely given gratuitously unless there was no other way to solve a problem, but some parents sought such help, and a few also sought help to deal with psychological problems whether or not they directedly affected child care.

*At least every other week during the first year; thereafter the schedule called for monthly contacts. In fact the contacts were in most cases more frequent since parents came to feel free to call whenever they needed or simply wished to do so.

Finally, through knowledge of the parents and the day-to-day life of the family, the home visitor provided liaison between the home and the center. One important aspect of such liaison was that when a family team member became concerned about a child, the home visitor could often shed light on probable causes as a result of knowing the parents and what was currently happening in the child's family life.

Pediatric Care: The pediatricians were responsible for periodic well child examinations and the care of the children when they were sick, from birth on. Routine visits were scheduled monthly for the first 12 months and thereafter at age 15, 18, 21, 24, 27 and 30 months. There was one main pediatrician for each and a backup pediatrician who also became well-known to the family. Protection of the health of the child in a comprehensive sense was as much a part of the pediatrician's role as was the treatment of illness. Because the project pediatricians were also child development specialists their records were rich in developmental as well as health data. In their relationship with parents there was emphasis from the beginning on helping parents bring their questions and observations about their children and increasingly to feel confident of their own ability to decide when they needed to seek or talk with the doctor. Respectful listening, helping to clarify questions or concerns and inviting parents' opinions were some of the ways in which parents were encouraged to participate actively in the health care of their children. The time allotted for the periodic examinations (up to an hour) facilitated this process. Both the information provided and the psychological support were seen as important. Pediatricians

gave advice about child rearing as well as about illness, seeking to provide this not in recipe form but in specific relationship to individual children and parents.

Developmental Examination: Developmental examinations, using the Yale Developmental Schedules, were administered when the children were 2, 3, 6, 9, 12, 18, 24 and 30 months of age by examiners (pediatrician and psychologist) who were not providing other services for the children they tested. The developmental examinations took place in conjunction with but preceding regular pediatric evaluations in the presence of one or both parents. The results of the test were passed on to parents either by the home visitor, pediatrician or the tester. One result of these sessions was that parents became interested in specific characteristics of their children such as their way of solving problems, their interests and often their sensitivities. It provided another way for them to know their child and the fact that the examiner was a familiar person facilitated the sharing of observations and information. Pediatric and developmental examinations were observed by non-participant observers through the one-way mirror. All of this information was funneled into the record on each family and contributed to understanding.

Daycare and Toddler School: The program of child care and education for study children was based on a view of how children develop and learn and a commitment to plan in accordance with developmental needs--attitudes that we, of course, share with others. Developmental propositions translated into practice included attention to the relevance of (1) the phase concept with its emphasis on specific tasks, competencies,

styles of interaction, needs and vulnerabilities (2) the central role of human relationships and how these influence learning for better or worse (3) the interdependence of cognitive, emotional and social development. Derivatives and corollaries of these constructs included the rationale behind the introduction of certain program elements at particular times, the handling of the separation experience for parents and child, the staffing pattern planned in relation to the child's need for continuity of care from a principal staff member and the importance of recognizing the individuality of the child. In full daycare, more than in contacts of shorter duration, teaching must be intimately concerned with the child's bodily needs in addition to knowing the child's tempo, feelings, style of learning--thus combining nurturing and teaching roles.

In summary the educational approach was--to repeat an apt if much used phrase--addressed to the whole child, and strong efforts were made to arrange experiences that would enhance physical, intellectual and emotional development.

Twelve study children were in the daycare program for varying lengths of time over the $2\frac{1}{2}$ years of the study. Five had 20 or more months in daycare; five had from 10-19 months and two spent 5 months or less. One was in neither daycare nor toddler school. Some began as early as 6 weeks of age, others not until well into their second year. For five children who did not need daycare, toddler school, the equivalent of nursery school adapted to their age and characteristics, was held twice a week for an hour and a half with their mothers always present. Children began toddler school between 15 and 18 months of age and continued until they were 30 months of age.

In all of the services, developing a partnership with parents in behalf of the child, being supportive of them rather than competitive and creating an atmosphere in which staff could work harmoniously with each other and with children and parents were seen as vitally important. Flexibility and adaptability of staff and program were goals not always achieved but always a part of the demand we placed upon ourselves. This meant first of all that each child's individual characteristics must be known and respected and that the program developed must be attuned to his/her developmental needs, changing as the child changed. It also meant that the staff had to be ready to respond to unexpected events in the lives of families, especially crisis situations.

Having described separately the four components of the service in the course of which the major research data were collected, it is necessary to again emphasize their interdependence and unity. The unique contributions of each component would have been of less value to the families if they had not been brought together as integrated parts of a whole. The members of each family team were in continuous contact with one another, sharing observations and information. Of immediate value was the ongoing synthesis of data from all sources as an aid in working out ways to help children and parents about whom concern developed. This integrative process, carried out in frequent formal and informal discussions, had a clarifying function with respect to the goals of the project and the philosophy of how to work effectively with both children and parents.

The accumulation of information as well as the formulations, speculations and actions in respect to it was the core of the research effort, of course, but here the emphasis is on the importance of the

co-ordination and synthesis of data, and of a shared philosophy as they influenced services. Whatever good came out of the work with children and parents was due, it is believed, not only to having a competent and committed interdisciplinary group but also to the co-ordination of effort.

Comparison Group Study

After the intervention project ended, it was recognized that the project data would be more meaningful if some data on a comparable group of children not involved in the project could be obtained. Accordingly, one year after the project ended, a Comparison sample of 18 children 30 months of age was selected. They were chosen from records in the same hospital clinic used to select the Research mothers. Families were matched on income, marital status of mother and race of parents; children were matched on sex and ordinal position. All Comparison children were full term and free from congenital defect or illness at birth, as were the Research children.

Each Comparison mother was seen for a single in-depth interview by a psychiatric nurse who was part of the project staff. The interview covered family history, demographic characteristics of the family, child's birth and health history, and child's general development. The interview was summarized in a narrative report. Each child in the Comparison group was seen once for developmental evaluation by a psychologist who had not been involved in the intervention project. The Yale Developmental Schedules were administered and a narrative report of the test findings and clinical impressions of the child was written.

In summary, the design employed was a static-group comparison (Campbell and Stanely, 1965). While the design provides some basis for evaluating the impact of the intervention program, it is acknowledged to have methodological weaknesses which would not be present in an experimental paradigm.

Follow-Up Study

In order to assess the long-term effects of the Yale Child Welfare Research Program, a follow-up study was carried out five years after the program terminated. This follow-up was conducted in collaboration with Edward Zigler, Ph.D. and Penelope Trickett, Ph.D., colleagues in the Yale Psychology Department with an interest in early daycare and its effects. The Trickett follow-up will not be described here, but is reported elsewhere (Trickett, 1979).

In the Child Development Unit follow-up, the 16 Research families still resident in New England were contacted, and all but one family agreed to participate. Each Research mother was seen for an interview of about one hour's duration by her home visitor from the project or by another familiar project staff member. The interview was flexible but was organized to cover a set of specified topics: changes in family unit, residence, education, occupation, and health since the project's close; the child's daycare and school experience subsequent to the project; the child's general development; and the mother's retrospective evaluation of the intervention program. The interview data were recorded in a narrative report. Each child was seen for one testing session by a child psychologist on the Child Development Unit Staff who had not been part of the original project. The Revised Wechsler Intelligence Scale

for Children, the Beery Test of Visual-Motor Integration, and the Draw-a-person were administered and a test report for each child was written.

RESULTS

The data analysis for the Yale Child Welfare Research Program consisted of three major components. The first component was the analysis of differences found between the Research group of 18 children and the matched Comparison group at 30 months of age. The second group of analyses concerned the interrelationships found between family characteristics and aspects of the children's development, as well as utilization of the intervention project by the Research families. Rather than being concerned with the overall impact of the project, these analyses probe the interdependency of family and child characteristics and relate these factors to project utilization. Finally, the third cluster of analyses related to the characteristics of the Research families and children at the five-year follow-up. While these data were relevant to the intervention program's lasting impact, they are also central to examining the relationships between early family and child characteristics and later outcomes.

The preliminary problem in data analysis was to select which data should be analyzed. With regard to the analyses contrasting the Research and Comparison groups, there was a great disparity in volume and character of data for the two groups. Data for the Research subjects consisted of approximately five volumes of narrative material for each family containing monthly home visitor reports, 15-20 pediatric reports, 7-8 developmental assessment reports, and a concluding home visitor summary of 25-50 pages. In contrast, data for the Comparison group consisted of a mother

interview summary of about 5 pages and a 30 month developmental test report. To reduce the discrepancy in data sources for the two groups, a decision was made to restrict the two-group analysis to the 30 month test report for each child, the Comparison group mother interviews, and the concluding home visitor summaries for the Research mothers.

The second major problem in data analysis was how to convert the wealth of narrative material into analyzable form. To accomplish this aim, four major rating instruments were developed. The Child Assessment Scale (CAS) and the Mother Interview Scale (MIS) were used for both groups and were ratings based on the developmental test report and mother interview summary for each child. The Project Utilization Scale (PUS) was used for the Research subjects only and was a distillation from the complete data file for each family. The Follow-up Interview Scale (FIS) was used to distill information from the narrative summaries of the follow-up interviews held with 15 Research mothers. These four instruments will be described briefly below.

The Child Assessment Scale (CAS) was a 17-item rating scale, with 4 levels per item, covering qualitative characteristics of the child's behavior such as attention span, anxiety, zest, coping skills, and presence of emotional problems. Ratings were done independently by Rescorla and another rater skilled in developmental assessment after a period of training and pilot ratings. All disagreements were settled by consensus. Range of agreement was from 55% to 82%; reliability was better than chance agreement at a high level of significance according to the weighted Kappa (Cicchetti, 1975) statistic.

The Mother Interview Scale (MIS) was a 38 item rating inventory covering demographic information, aspects of parental history, assessments of current parental functioning, child's health history, and child rearing practices. Ratings were done independently by Rescorla and a clinical social worker, with all disagreements settled by consensus. Agreement was 90-100% on factual items and 60-75% on qualitative judgements, with good reliability as assessed by weighted Kappa.

The Project Utilization Scale (PUS) was a 12 item inventory summarizing each Research family's use of the four project components: pediatric care, developmental assessment, home visitor, and daycare. Ratings were done by Rescorla in collaboration with the staff members who best knew each of the families.

The Follow-up Interview Scale (FIS) was a 21 item inventory summarizing family and child characteristics at follow-up. Topics included family history since follow-up and the mother's assessment of her child's development. Ratings were done by Rescorla in collaboration with the author of the interview summary.

Two-Group Comparison at 30 Months

Developmental test scores: The Research and Comparison groups were compared on their performance on the Yale Revised Developmental Schedules at 30 months of age. This is a composite test scale including items from the Gesell, Viennese, Merrill-Palmer and Binet tests organized into a protocol of five categories: gross motor, fine-motor, adaptive, language and personal-social developmental. Global developmental age and developmental quotient can be computed as well as DA and DQ in each of the five

categories. Two-way analysis of variance was used to examine group and sex differences on total developmental quotient (TDQ), adaptive developmental quotient (ADQ), and language developmental quotient (LDS), each with a norm of 100. Because the groups were matched, Group was treated as a within subjects factor using a repeated measures analysis of variance.

As can be seen from Table 1, there was a small but non-significant superiority of the Research group over the Comparison group and of girls over boys for both TDQ and ADQ. However, there was a highly significant difference on language DQ favoring the Research group, ($F=14.05$, $df=1$, $p < .001$). For the Research group LDQ was almost as high as ADQ (99 vs 106), whereas Comparison group children were already markedly delayed in language development relative to their adaptive performance (85 vs 101). This finding would suggest that the two groups of children were comparable in terms of basic congitive-perceptual capacities, but that the intervention program had served to offset the detrimental effect socio-cultural deprivation often has on emerging language function which was evident in the Comparison group.

An item analysis of the children's developmental test performance revealed that the Research group superiority in language function was manifest in both vocabulary and syntactic development: identification and labelling of pictures, presence of plurals in speech, labelling of an action in a book, and the absence of "baby talk" jargon in speech, all significant differences by Fisher's exact test ($p < .05$).

CAS scores. Using a Group X Sex analysis of variance, there were no significant differences for total Child Assessment Scale (CAS) score or for any of the component item scores. In other words, given the

procedures used to compare the two groups, they were indistinguishable in terms of such characteristics as attention span, drive for mastery, relatedness to examiner, and presence of emotional problems.

MIS data. Group differences on the 38 mother interview scale items were explored using χ^2 analyses. There were only 4 items which significantly differentiated the two groups--one related to demographic factors and three, more experiential or psychological in character.

In the area of demographic factors, only one Research father was the sole supporter of his family, compared to five Comparison fathers ($\chi^2=5.89$, df=2, $p < .052$). This finding appears to reflect more intermittent unemployment or a higher rate of underemployment in the Research group. However, more Research fathers made some economic contribution to the family than did Comparison fathers (10 vs 8). It is worth noting that despite the availability of free daycare in the intervention project, the same number of Research and Comparison mothers worked (8 mothers). 13 Comparison families were self-suporting, as opposed to 8 Research families supported without welfare or supplementary benefits, although this difference was not significant. Finally, more Research children lived alone with their mothers than did Comparison children (9 vs 5), and more Comparison children had a significant male figure (not the father) in contact with the family than did Research children (8 vs 4).

While most of these demographic findings were not statistically significant, the pattern of findings suggests that the Comparison group may have been a more intact and better functioning group of families at the outset than the Research families. While this outcome reinforces Campbell's and Stanley's (1963) admonition against comparison group

matching as a procedure, it makes the finding of language superiority in the Research group more compelling than it might otherwise be.

One of the three psychological-experiential variables which significantly differentiated the two groups also points to some superiority favoring the Comparison group. Eight Comparison group mothers were rated as having good psychological adjustment and coping, as opposed to only three Research mothers (χ^2=4.33, df=1, $p < .05$). Corollary non-significant trends were that Comparison homes were less frequently rated as hostile or depressed in tone and either overstimulating or understimulating in quality than Research group homes. While these three findings may reflect genuine group differences, it is also possible, even probable, that they reflect the superficial acquaintance the project staff had with the Comparison group. It would not be suprising if problems in functioning or areas of pathology were more evident in Research mothers, because staff members knew them so much more intimately and had so much more information about them.

It is important to note that by the method of data analysis used for these analyses, no significant differences were found between the groups on important child-rearing variables such as amount of cognitive stimulation, provision of play materials, nurturance, or discipline. However, there was a highly significant difference between the two groups of mothers on their expectations for their children. Nine Research mothers were rated as expecting their child to be more mature than his age in behavior, habit training, or development. No Comparison mothers were seen as setting this type of overly high standards (χ^2=12.86, df=3, $P < .005$). Furthermore, ten Research mothers felt that their child

had some or many problems in development, but only two Comparison mothers expressed such concerns ($\chi y^2=6.12$, df=1, $p < .01$).

These two findings suggest that Research mothers set higher standards for their children and were more critical and/or observant about their child's problems than Comparison mothers. What is not clear is whether the Research mothers were predisposed to having high expectations for their children and thus attracted to participation in the project, or alternatively, that participation in the project in some way fostered these attitudes. It is important to stress here that while a main project goal was to foster parental aspirations for school achievement and social advancement, an equally important goal was to help parents be realistic with regard to habit training, behavior, and development accomplishments and to not demand overly mature behavior in these areas.

Interrelationships between family characteristics, child variables and project utilization:

Correlational analysis was used to explore relationships between child DQ, child characteristics, family variables, and project utilization. Factor analyses were done on the CAS and MIS, to look at the composition of the two inventories.

For the CAS, three major factors were derived from a principal components analysis, accounting for the 73% of the variance. Using a varimax rotation, the major factor (45% of variance) reflected compliant, co-operative behavior during the testing session. The second factor (16% of variance) reflected zest and animation in response to objects and people. The third factor (12% of variance) appeared to reflect physical and cognitive development.

Six major factors were derived from a principal components analysis and varimax rotation of the MIS, accounting for 68% of the total variance: Factor 1 (18% of variance) related to intactness of family group; Factor 2 (14% of variance) involved mother's level of attrainment in education and employment; Factor 3 (13% of variance) pertained to physical and emotional quality of the home environment; Factor 4 (9% of variance) loaded on both psychological adjustment of the mother and mother's expectations and handling of her child; Factor 5 (8% of variance) pertained to neonatal and child health; lastly, Factor 6 (6% of variance) related to child-rearing characteristics such as cognitive stimulation, play materials, and nurturance. This factor solution appeared to validate the rationale used in construction of the scale, in that the major factors described corresponded closely to the topic headings of the scale items.

The relation between child DQ and other variables was a main focus of the correlational analyses. When the data for the combined Research and Comparison groups were examined, only two variables were significantly related to TDQ at 30 months: amount of cognitive stimulation ($r=.66$, $df=34$, $p < .01$) and provision of play materials ($r=.58$, $df=34$, $p < .01$). These two variables were also significantly correlated with each other ($r=.63$, $df=34$, $p < .01$). Similar significant correlations were found between these childrearing variables and both ADQ and LDQ, with cognitive stimulation more highly correlated with LDQ and play materials more highly related to ADQ.

The findings on DQ described above were also obtained when the Research group data were analyzed separately. Additionally, several inter-

esting relationships emerged between child DQ and family project utilization. It appeared that language development as measured by LDQ was positively related in some measure to number of months spent in the daycare program of the project. (The correlation was only significant when one child was credited for months spent in another daycare center when the family moved out of town temporarily). Thus, it seems plausible to infer that the Research group superiority in language development may have been partially attributable to the enrichment provided by the daycare program.

Child TDQ was significantly related to three indices of project utilization: parental involvement and interest in child developmental exam performance ($r=.62$, $df=16$, $p < .01$), parental involvement and interest in the daycare program ($r=.76$, $df=10$, $p < .01$), and parental positive relation to the daycare staff ($r=.67$, $df=10$, $p < .05$). Thus, general cognitive competence in the child was closely linked with parental involvement in and effective utilization of aspects of the intervention program.

Because of their high correlation with TDQ, the two variables pertaining to parental relation to the daycare program were examined in some detail. While the two variables were not significantly correlated with one another, there appeared to be some pattern evident in their relation to other variables. The families who were most involved and interested in the daycare program tended to be those in which fathers made an economic contribution, mothers were employed, mothers nad been married, and the family was self-supporting (correlations of .79, .71, .77, .62, $df=10$, $p < .05$). Similarly, families with a strong positive relation to

the daycare staff had mothers with a more skilled level of employment and more education (correlations of .74 and .65, df=10, $p < .05$); these families also had better daycare attendance, used pediatric care more appropriately, and complied more with pediatric recommendations (correlations of .75, .86, .63, df=10, $p < .05$). While this pattern of findings is complex and the sample size is small, there is an implication in the data that parents who were married, had more education, better employment, and were more nearly self-supporting tended to be more involved in the intervention program and to utilize services more effectively than less well-functioning families.

Another focus of the analysis was the interrelationship between the various experiential or psychological variables. When the combined Research and Comparison group data were used, significant correlations were found indicating that when the mother was rated as more well-adjusted psychologically the emotional climate of the home and the level of stimulation in the home were rated as more favorable (r=.58 and .70, df=34, $p < .01$). Mother's psychological adjustment was also highly related to good discipline practices (r=.61, df=34, $p < .01$) and less strongly related to nurturance of the child (r=.38, df=34, $p < .05$). It should be noted that emotional climate, level of stimulation, discipline, and nurturance were all significantly intercorrelated with one another as well (correlations of .44 to .82).

Finally, there were a number of important correlations regarding utilization of the home vistor component of the project for the Research children. Mother's relationship to the home visitor, use of the home visitor for services, mother's sharing of concerns, and mother's

seeking advice from the home visitor were all significantly intercorrelated with each other (correlations of .57 to .79, df=10, $p < .05$). It is interesting to note that mother's use of home visitors recommendations was not closely related to these other home visitor variables. However, use of home visitor recommendations was significantly correlated with rater's assessments of the mother's psychological adjustment and coping ($r=.72$, df=16, $p < .01$). The findings supports a widely held clinical impression that disturbed or poorly adjusted clients have difficulty utilizing advice. Alternatively, the finding might be interpreted as showing that mental health professionals tend to regard clients who have difficulty using advice as poorly adjusted and present them as such in their records.

Follow-Up Findings

The findings from the five year follow-up study fall into two broad classes. Firstly, there are data on the children and families at time of follow-up which are relevant to the question of the long-term impact of the intervention project. Secondly, there are the interrelationships found between child and family characteristics at 30 months and follow-up outcome.

Long term impact of the intervention. Data documenting some sustained, long-term impact of the intervention program were obtained in both the follow-up studies conducted. Findings from the Trickett follow-up will not be described here, as they appear elsewhere in a separate report (Trickett, 1979). It can be said, however, that they show a continued effect of the intervention program on both child Peabody Picture Vocabulary Test IQ and school achievement as measured by the

Peabody Individual Achievement Test. Intelligence test data from the Child Development Unit follow-up suggested that the Research children continued to function somewhat above the norm for inner-city, disadvantaged children. The average score for the 15 Research children tested on the WISC-R was 91.8, with only a negligible 5 point superiority of Performance IQ over Verbal IQ. This VIQ-PIQ pattern suggests that some strength in language function continued to characterize the Research children, relative to what is often found in disadvantaged samples.

The strongest findings obtained from the follow-up pertain to general upward mobility of the Research families. As can be seen in Table 2, the families showed striking gains by several indices of upward mobility, relative to their position at the beginning of the project. As there are no comparable data available for a control sample, it cannot be proven that the intervention project was responsible for these gains rather than some other factor such as self-selection of the sample. However, the data to be outlined below certainly are not typical of the cycle of poverty associated with disadvantaged families.

In the area of educational advancement, 10 out of 17 research mothers obtained some further education during the project: 2 graduating from high school, 6 taking some form of training course, and 2 taking college courses. At the time of follow-up, eight mothers had continued to advance educationally, with four taking training courses and four working toward BA degrees.

A parallel pattern was evident in terms of progress toward economic self-sufficiency. At the end of the project, the number of families on welfare had declined from nine to six, with eight entirely self-supporting and three partially self-supporting families. At the time

of follow-up, there were only three families still on welfare, eleven families were self-supporting, one was partly self-supporting, and two were supported by government college education grants.

A qualitative assessment was made of general improvement in life style and quality of life for the Research families. The criteria for improvement were one or more of the following: improvement in housing, medical care, socioeconomic status, educational or training status, social life, and engagement in community life. By the end of the project, twelve families had improved moderately in quality of life using these criteria. At the time of follow-up, eleven families showed clear evidence of tangible improvements in quality of life and expressed attitudes of a belief in a progressively better life. Three others did not seem materially better off but seemed happier in their personal life and more positive in outlook. Only one mother seemed to have deteriorated in quality of life and general functioning.

Finally, the project appears to have had a striking effect on birth rate in the Research families. At the end of the project 14 families still had only one child, with two families having two children and one family having three. At follow-up, there were ten families still with only one child, four families had two children, and three families had three or more children (which in one family was a set of twins).

Interrelationships between 30 month and follow-up variables. The relationships between follow-up intelligence test scores (PPVT IQ, WISC-R PIQ, WISC-R VIQ) and 30 month variables were examined by correlational analysis and stepwise multiple regression. Predictor variables used in the multiple regression analyses were ADQ and LDQ at 30 months, and the

factor scores for each child on the three CAS factors and six MIS factors described above.

The best predictor of PPVT IQ was the MIS factor related to cognitive stimulation and play materials, accounting for 72% of the variance with a highly significant F ratio ($F=39.51$, $df=1, 15$, $p < .001$). LDQ at 30 months was the only other predictor variable which met the criterion for entering the regression equation ($F=7.08$, $df=2, 14$, $p < .01$), raising the PPVT variance accounted for to 82%. Correlational analysis supplemented the multiple regression findings and demonstrated several other significant relationships. PPVT IQ was significantly correlated with 30 month total DQ, adaptive DQ, and language DQ (correlation of .76, .75, .77, df-15, $p < .01$). PPVT IQ at follow-up was also positively correlated with mature, cooperative, and persistent behavior at the 30 month testing session, as measured by CAS total score ($r=.61$m, $df=15$, $p < .01$). There were also significant correlations between PPVT IQ and some 30 month demographic and project utilization variables: children had higher PPVT IQs in families where mothers had been married, when fathers had made some economic contribution, and when utilization of the pediatric care and the developmental assessment components of the project had been high. These findings replicate some of the 30 month findings, notably that higher IQ's were found in children from homes with more cognitive and play enrichment.

Relationships between the follow-up WISC-R and the 30 month variables were complex. The correlation of WISC FIQ and TDQ at 30 months was .58 ($df=13$, $p < .05$). It is interesting that the correlation between Adaptive DQ at 30 months and Performance IQ at follow-up was .73 ($df=13$, $p < .01$), whereas the correlation between Language DQ at 30 months and

Verbal IQ at follow-up was only .44 (n.s.). In other words, performance on perceptual-motor and form perception items was quite consistent for these children from $2\frac{1}{2}$ to age 8 but language proficiency as measured by the Yale Revised Developmental Schedules at 30 months did not predict VIQ performance on the WISC. There was a marginally significant correlation of .51 (df=13, $p < .05$) between LDQ at 30 months and the Vocabulary subtest of the WISC-R, which is the Verbal subtest most similar to the language items tested at 30 months.

There was no clear pattern of relationship between WISC-R PIQ and VIQ and demographic, child-rearing, or project utilization variables at 30 months. PIQ and VIQ were each significantly correlated with a few scattered 30 month variables but there was no overlap between sets. A stepwise multiple regression confirmed that PIQ was significantly predicted by 30 month ADQ (53% the variance in PIQ), but there were no significant predictors of VIQ. However, there was a significant correlation between WISC-R FIQ and CAS total at 30 months (r=.75, df-13, $p < .01$). As with the PPVT IQ score, children who were more cooperative and mature and animated at 30 months scored higher on the WISC-R at follow-up.

Follow-up WISC FIQ was correlated .74 with the PPVT given in approximately the same month by a different examiner (df=13, $p < .01$), with WISC scores being consistently lower than Peabody Scores. There was a very high correlation of .81 (df=13, $p < .01$) between Verbal IQ on the WISC and performance on the Peabody Individual Achievement Test (PIAT). Correlation of PIAT and Performance IQ was minimal. Implications of these data are that the skills measured by the WISC Verbal scales are those most central to school achievement in reading, spelling, math, and general information; furthermore, attainment in these skills was not well predicted by the variables measured at 30 months.

The last relationship of interest to report is that mother's view of the child's development at follow-up was highly correlated with her view of the child at 30 months ($r=.80$, $df=13$, $p < .01$). It appears the mothers were basing their appraisal of their children's development in large measure on the child's academic and verbal achievement, as shown by correlations of .60 and .55 respectively between mother's view of development at follow-up and PIAT total achievement score and WISC-R VIQ ($df=13$, $p < .05$). The mother's perception of her mother's behavior in school also seemed to contribute to her overall view of the child's development ($r=.53$, $df=13$, $p < .05$).

Discussion

The Yale Child Welfare Research Program was designed as a service-centered longitudinal study, a choice of design that strongly influenced its methodology. It is recognized that each research plan offers access to a limited number of issues and has advantages and disadvantages. The service-centered investigation is a form of action research, a term that applies to situations in which the investigator not only observes but acts within the field of observation and is a part of the process he studies. Thus the study did not employ the paradigm of experimental or laboratory research but derived from a clinical orientation. This approach must be taken into account in considering the study's methods and findings.

To amplify, the position taken in this research was that a study in the context of provision of services by experienced clinicians and educators would provide very rich data, highly relevant to the goals of the project. We chose, also, to study the children and parents over a

time span in order to document the children's development as continuously as possible, as well as the development of the young adults as parents. There were also advantages in the continuity of the investigators: participating families and family team became increasingly able to communicate as time passed. The expectation that the contact over time would result in progressive enrichment of the data was confirmed. For example, important material about the parents' own childhood came to light especially around the relationship to the growing child. Information tended to become more personal and relevant as the contact continued and trust in the study staff increased. It was also apparent that the growing familiarity of the staff members with the study population increased their sensitivity and made them better observers. Thus we believe that the clinical-developmental approach provided data that reasonably reflects the complexity of human development and discourages simplistic conclusions. However, the very richness and complexity of the data make its organization and analysis difficult. As must be obvious, the data presented here represent only a small part of the data collected during the project--namely those data which were amenable to conventional tabulation and statistical analysis. The other data collected will serve as the basis for forthcoming reports with a different frame of reference.

The findings from the Yale Child Welfare Research Program constitute a modest but important addition to the literature documenting the effectiveness of early interventions for disadvantaged families. The research described here documents that a broad scope, clinically-oriented intervention program can be effective in fostering child development for disadvantaged infants and their families. A finding of particular

interest is that without the intervention program's having a focussed or structured curriculum such as that of Levenstein (1977) or Schaefer and Aaronson (1972), there was a highly significant effect on the children's language development at 30 months of age relative to Comparison subjects.

While the presence of a program effect at the termination of the project is a gratifying finding, the more impressive evidence for the program's ultimate impact derives from the follow-up data. The Research children's performance on the WISC-R at 5 year follow-up was somewhat above the norm for disadvantaged samples; furthermore, the children's verbal abilities had kept pace with their performance skills, which is a pattern not universally found in inner city samples. Evidence from the Trickett follow-up (Trickett, 1979) indicated a long term effect on PPVT IQ and PIAT school achievement. Thus, the program impact in child IQ and achievement did not appear to "fade out" after the project ended.

The long term project impact on family patterns appear to be the most striking findings of the research. A primary thrust of the program was to help the project families achieve their aspirations for an improved quality of life. The follow-up data revealed impressive upward mobility of the families in terms of improvements in residence, educational advancement, and economic self-sufficiency. The low birth rate in the Research families at follow-up is a further suggestion of a change toward more autonomous control of important life decisions and a striving for improved social circumstances. As the ratings on quality of life indicated, the majority of the Research families appeared to have made significant and substantial improvements in their lives at the

time of follow-up. While these changes cannot be incontrovertibly attributed to the program, it was certainly the belief of many of the family members, as well as of the project staff, that the program had played a significant role in these improvements.

In addition to the specific outcomes of the Yale Child Welfare Research Program described in this paper, the project has implications of a more general nature for the field of early intervention. The project data suggest that the intervention's primary effect was its impact on families--on their aspirations, life choices, and patterns of functioning. It is certainly the impression of the clinicians who provided the intervention services that the crucial ingredient of the program was a committed, concerned belief that both the families and the children were important in their own right, and that the role of the service providers was to help each individual in the program realize his or her potential as fully as possible.

The Yale Child Welfare Research Program served an educational role, by such activities as helping new mothers learns to use pediatric care effectively, or aiding families in negotiating for public housing, or encouraging mothers to provide appropriate stimulation for infants. However, the program was quite definitely <u>not</u> designed to teach parents how to educate or interact with their children, in the manner of such projects as Levenstein's (1977) toy demonstration model or Schaefer's (Schaefer and Aaronson, 1972) home tutoring model. The fact that significant project effects have been achieved in such a variety of programs with so many diverse approaches suggests that the crucial mediating factors of many interventions may be interpersonal and motivational

ones--that the recipient of the intervention comes to believe that the service provider values him as a person and considers his or her development and achievement as an important goal worth striving for.

The results of the Yale Child Welfare Research Program are consistent with Bronfenbrenner's (1974) view that a project must significantly impact family patterns and attitudes in order to have long-standing effect. The findings from the Trickett (Trickett, 1979) follow-up provide further evidence that the Research families continued to actively strive for their children's advancement, in such ways as choosing to send their children to parochial school or in assuring that their children maintained good school attendance. Furthermore, the project underscores the importance of <u>early</u> intervention by showing that a difference between intervention and comparison children in language development can be detected as young as 30 months of age.

While the preceding discussion has implied this point, it must be reiterated that the results of the Yale Child Welfare Research Program highlight the importance of using a multiplicity of outcome variables as an index of project effectiveness, such as advocated in Zigler and Trickett (1978). For instance, overall child DQ did not show a significant program effect at 30 months, whereas a strong effect was obtained in the area of language function. We would argue that at the age of 30 months, the cognitive-perceptual tasks tested reflect in large part maturation of the cognitive-perceptual and sensori-motor systems and would be less likely to show the impact of cultural enrichment and environmental stimulation than would language function, within the range of relatively normal endowment and environment sampled in intervention studies of this

type. Another example of the importance of multiple dependent variables are the data on family characteristics such as educational attainment, upward mobility, and birth rate, which were among the more striking outcomes of this program.

Among the general implications of the program is one derived from the fact that effective utilization of the project services varied considerably. As reported, the data suggest that the better-functioning families made best use of the services. However, looking beyond this correlation, examination of the individual families reveals striking exceptions to this general pattern which illuminate the issue of why some were better able than others to utilize the program for helping themselves. Despite some similarities in members of this disadvantaged group, there were large variations in them, as in other groups, with respect to general adaptive abilities, personality characteristics, and capacity for relating and trusting others and developing as parents. They also varied widely in their childhood experiences, including the strengths in their families or origin and the quality of their nurturance, conditions which influenced their capacities as adults. This study suggests that once good services are made available by qualified personnel who respect their clients and understand human complexity, what will be utilized depends upon the participants, what they bring to the situation, and hence what each can use. One implication of this study for social policy is that intervention programs for disadvantaged families should provide a spectrum of quality services, offering options which are responsive to the needs of individual participants.

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Footnotes

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Table I

Developmental Quotients at 30 Months

Total DQ

	Research Group	Compar. Group	
Boys	102.0	93.6	97.8
Girls	110.4	105.1	107.8
	105.3	98.1	

Adaptive DQ

	Research Group	Compar. Group	
Boys	103.6	98.3	100.9
Girls	110.1	106.7	108.4
	106.2	101.5	

Language DQ

	Research Group	Compar. Group	
Boys	97.5	79.6	88.6
Girls	102.3	94.7	98.5
	* 99.4	85.5	

*$F_{1, 16} = 14.05$, $p < .01$

Table II

	Project Start	Project End	Five Year Follow-Up
Mothers' Educational Level	11 high school graduates 6 some high school	10 with more education: 2 finished high school 6 took training course(s) 2 took college course(s)	8 with more education: 4 took training course(s) 4 working toward B.A. deg.
Source of Support	7 self-supporting 1 supported by parents 9 on welfare	8 self-supporting 4 partially self-supporting 5 on welfare	11 self-supporting 1 partially self-supportin 2 on college grants 3 on welfare
Number of children in family	17 had 1 child	14 had 1 child 2 had 2 children 1 had 3 children	10 had 1 child 4 had 2 children 3 had 3 or more children